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Signature

February 6, 2007
Date

APPLICATION NO.	10/633,145
FILING DATE	07/31/2003
FIRST NAMED INVENTOR	Ken L. Chang, et al.
ART UNIT	2627
CONFIRMATION NO.	5429
EXAMINER	Mark S. Blouin
ATTORNEY DOCKET NO.	K35A1301

TITLE	STAMPED ACTUATOR ARM HAVING LONGITUDINALLY SPACED-APART STAMPED PROTRUSIONS FOR SUPPORTING A TRACE SUSPENSION FLEX

ATTACHED WITH THIS SUBMISSION:

1. Petition for Revival of an Application for Patent Abandoned Unintentionally Under 37 CFR 1.137(b) (2 pages)
2. Fee Transmittal for FY 2006 (1 page)
2. Appeal Brief (13 pages)

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PTO/SB/17 (01-06)
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Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2006

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 2,000

Complete if Known	
Application Number	10/633,145
Filing Date	07/31/2003
First Named Inventor	Ken L. Chang, et al.
Examiner Name	Mark S. Blouin
Art Unit	2627
Attorney Docket No.	K35A1301

METHOD OF PAYMENT (check all that apply)

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For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

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FEE CALCULATION (All the fees below are due upon filing or may be subject to a surcharge.)

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

	FILING FEES		SEARCH FEES		EXAMINATION FEES		
		Small Entity		Small Entity		Small Entity	
Application Type	Fee ($)	Fee ($)	Fee ($)	Fee ($)	Fee ($)	Fee ($)	Fees Paid ($)
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims _____ - 20 or HP = _____ x _____ = _____ Extra Claims / Fee ($) / Fee Paid ($)

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims _____ - 3 or HP = _____ x _____ = _____ Extra Claims / Fee ($) / Fee Paid ($)

HP = highest number of independent claims paid for, if greater than 3.

Multiple Dependent Claims — Fee ($) _____ Fee Paid ($) _____

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets _____ - 100 = _____ Extra Sheets / 50 = _____ Number of each additional 50 or fraction thereof (round up to a whole number) x _____ Fee ($) = _____ Fee Paid ($)

4. OTHER FEE(S)

Non-English Specification, $130 fee (no small entity discount) — Fees Paid ($) _____

Other (e.g., late filing surcharge): Appeal Brief (FC 1402) - $500; Petition for Revival (FC 1453) - $1,500 — 2,000

SUBMITTED BY

Signature		Registration No. (Attorney/Agent) 45,686	Telephone (949) 672-6119
Name (Print/Type)	Joshua C. Harrison, Ph.D., Esq.		Date February 6, 2007

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Ken L. Chang, et al.	Art Unit:	2627
Serial No.:	10/633,145	Examiner:	Mark S.Blouin
Filing Date:	07/31/2003	Confirmation No.:	5429
For: STAMPED ACTUATOR ARM HAVING LONGITUDINALLY SPACED-APART STAMPED PROTRUSIONS FOR SUPPORTING A TRACE SUSPENSION FLEX		Docket No.:	K35A1301

APPEAL BRIEF

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir,

The following appeal brief is submitted pursuant to a Notice of Appeal filed on 06/12/2006 for the above-identified application.

I. REAL PARTY IN INTEREST

The real party in interest for the above-identified patent application is Western Digital Technologies, Inc. (see assignment REEL/FRAME: 14377/0349 identifying Western Digital Technologies, Inc. as assignee of the entire right, title and interest of the above-identified patent application).

II. RELATED APPEALS AND INTERFERENCES

There are no known appeals or interferences related to the instant appeal.

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III. STATUS OF CLAIMS

Claims 1-9 are pending.

Claims 1-9 stand rejected under 35 USC §102(e).

IV. STATUS OF AMENDMENTS

No amendments have been filed after the 5/16/2006 final rejection of claims 1-9.

V. SUMMARY OF CLAIMED SUBJECT MATTER

FIGS. 2-3 (described on page 6, line 7 through page 7, line 6 of applicants' specification) depicts a head stack assembly 28 according to a claimed embodiment of the present invention. Stamped actuator arm 34 includes an actuator arm side surface 70 and a plurality of longitudinally spaced-apart stamped protrusions 72, 74, 76, each stamped protrusion extending from actuator arm side surface 70 in a direction generally perpendicular to pivot axis 48. The three stamped protrusions of stamped actuator arm 34 support a trace suspension flex and the stamped protrusions are generally equally spaced-apart longitudinally along the actuator arm side surface. A head gimbal assembly 40 is attached to stamped actuator arm 36. Head gimbal assembly 40 includes trace suspension flex 96, which is supported by stamped protrusions 80, 82, 84. Trace suspension flex 96 may be suitably attached to protrusions 80, 82, 84 via adhesive. The distal end of trace suspension flex 96 is attached to a portion of flex assembly 62.

FIGS. 6-7 (described on page 7, lines 14-19 of applicants' specification) depicts a head stack assembly according to another claimed embodiment of the present invention. As shown, each stamped actuator arm includes two stamped protrusions for supporting a given trace suspension flex. For example, stamped protrusions 88, 90 are on one stamped actuator arm and stamped protrusions 92, 94 are on the other stamped actuator arm. Each stamped protrusion extends from an actuator arm side surface in a direction generally perpendicular to pivot axis 98.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-9 stand rejected under 35 USC §102(e) as anticipated by U.S. Patent Application Publication 2002/0163763 to Budde (hereinafter "Budde").

The examiner asserts that Budde discloses a stamped actuator arm. The examiner's rejections depend upon Budde's "base plate area" 202 being construed as a part of that stamped actuator arm. The examiner further asserts that Budde discloses a trace suspension flex with a plurality of conductors supported by a metal base layer. The applicants respectfully disagree.

VII. ARGUMENT

I. THE ISSUES UNDER 35 U.S.C. §102(e)

A. All claim rejections should be reversed because the stamped suspension disclosed by Budde is not the same component as the actuator arm.

The final rejection cites paragraph [0048] of Budde (USPub 2002/0163763) as being prior art disclosure of a "stamped actuator arm." However, paragraph [0048] of Budde discloses a stamped "suspension," not a stamped actuator arm. Budde labels and calls-out the suspension 112 separately and distinctly from the actuator arm 114. They are simply not the same component. Moreover, Budde's disclosure in paragraph [0027] that the suspensions 112 are "attached to" the actuator arms 114 is further proof that Budde considers them to be different components – not the same component. Therefore, Budde's disclosure that the suspension is stamped does not suffice as disclosure that the actuator arm is stamped for the purposes of anticipation under 35USC§102(e), and the claim rejections should be reversed.

Furthermore, an actuator arm and a head suspension most certainly do NOT have the "same structure and function" within a disk drive. The examiner's statement to the contrary on page 4 of the final office action is clearly erroneous.

The function of the suspension subcomponent of an HGA is well known in the disk drive industry: to be compliant and to function as a spring that allows the slider subcomponent to follow out-of-plane undulations of the moving disk surface. The Budde reference itself alludes to this function of a suspension in paragraph [0004]: "The spring force provided by the

suspension is designed to allow the head to follow height variations on the surface of the medium without impacting the medium or moving too far away from the medium."

On the contrary, the function of an actuator arm is to be non-compliant to out-of-plane disk surface undulations and to behave, as far as practically possible, as a rigid body. This function accords with the well-known purpose of an actuator arm to simply transfer the rotary motion of the voice coil motor into in-plane motion of the mounted HGAs, across the disk surface, for data track accessing and data track following.

The structure of a suspension accords with its function as a vertically compliant spring; suspensions invariably include a thin compliant spring area. The Budde reference itself alludes to this aspect of suspension structure in paragraphs [0004] and [0006], as follows: "Typically, a suspension includes three distinct areas: a base plate area that connects to the actuator arm, a spring area that provides a vertical spring force to bias the head toward the medium, and a load beam that extends from the spring area to the head/gimbal assembly. ...[T]he prior art has developed several techniques for forming a suspension so that the thickness of the spring area is less than the thickness of the load beam."

The structure of an actuator arm is very different and accords with its intended function to be non-compliant to out-of-plane disk surface undulations and to behave, as far as practically possible, as a rigid body. Specifically, the structure of an actuator arm is much thicker than that of a suspension, and (of course) actuator arm structures lack a compliant bend region. For example, Budde Figure 1 clearly shows that actuator arm 114 is much thicker than suspension 112. Also, Figure 3 of the present application clearly shows each of actuator arms 34,36 lacks a compliant bend region and is much thicker than each of the suspensions of HGAs 38, 40.

Those of ordinary skill in the art recognize the aforementioned significant differences in the structure and function of actuator arms versus head suspensions in the context of disk drive technology, and the examiner is erred in pretending that the distinction does not exist.

B. All claim rejections should be reversed because the stamped suspension disclosed by Budde is not a part or portion of the "actuator arm" as both Budde an the pending application use that term.

The claim rejections all depend upon the examiner's conviction that "[t]he suspension 112 and the head gimbal assembly are integral parts of the actuator arm and comprise the full structure as an actuator arm," as the examiner writes without any citation to authority on page 3 of the final office action. However, there is absolutely no support in the Budde specification or in the pending application for this personal conviction.

On the contrary, the Budde specification expressly supports the opposite conclusion. For example, Budde's disclosure in paragraph [0027] that the suspensions 112 are "attached to" the actuator arms 114 indicates that Budde considers them and labels them as distinct components – not the same component. Also for example, Budde's disclosure (in paragraph [0029]) that the base plate of the suspension is "later swaged to an actuator arm" is further proof that Budde considers them to be distinct components.

Therefore, the protrusions 208, 210, 212 in Budde are clearly not a part of an "actuator arm," as required by all of the presently pending claims. Rather the protrusions 208, 210, 212 in Budde protrude from a "base plate area" 202 of a "suspension" 200 (see e.g. paragraph [0028] of Budde). Budde considers the suspension 200 (including base plate area 202) to be distinct from the actuator arms (called "track accessing arms") 114. See, e.g., the first sentence of paragraph [0027] of Budde.

C. All claim rejections should be reversed because the examiner's interpretation of Budde requires the baseplate to be excluded from the head gimbal assembly (HGA).

The presently pending claims specifically require that the HGA include a base plate component. Although the base plate area 202 of Budde may satisfy the pending claim requirement of a "base plate," that can only be true if the base plate area 202 is properly considered to be part of an HGA. In that case, however, the protrusions 208, 210, 212 must be properly understood to extend from a sub-component of an HGA, not from any separately-claimed and distinct "actuator arm." Certainly both the pending claims and Budde rule out the possibility that the base plate be considered as part of the "actuator arm" (which is recited separately from the suspension or HGA in both applications). However, if the base plate area 202 in Budde is improperly construed to be part of the actuator arm 114 (rather than being properly construed as part of the HGA that includes suspension 112 and slider 110), then

consistency would require Budde to also be understood to lack the teaching of an HGA that includes a base plate (as required by all of the pending claims).

D. All claim rejections should be reversed because Budde does not disclose a "trace suspension flex".

Budde does not disclose a "trace suspension flex" as required by all of the presently pending claims. Paragraph [0029] of Budde mentions only "a flex circuit." Budde fails to specify whether "a flex circuit" refers to an individual trace suspension flex that is a sub-component of a single head gimbal assembly (HGA), or else refers to the main flex cable that electrically connects all of the HGAs in the head stack assembly (HSA) to the disk drive's printed circuit board assembly (PCBA). The main flex cable and the trace suspension flex are separate and distinct components as understood by those of ordinary skill in the art, and single contemporary disk drives include both of those components. Contrary to the examiner's unsupported statement in the final office action, the flex cable and trace suspension flex do not have the "same structure and function" and are not substitutes for each other. For example, it is well known in the art that a typical trace suspension flex is an HGA component, includes a metal base layer, and carries the electrical signals for a single head, whereas a typical flex cable is an HSA component, lacks a metal base layer, and carries the electrical signals for all of the heads in the disk drive.

E. All claim rejections should be reversed because Budde does not disclose a trace suspension flex that has a "metal base layer and a plurality of conductors supported by the metal base layer".

Budde utterly fails to disclose a trace suspension flex that has a "metal base layer and a plurality of conductors supported by the metal base layer," as required by all of the presently pending claims. Even if additional meaning were lent to the language "a flex circuit" in Paragraph [0029] of Budde, such that the phrase were construed to connote "trace suspension flex," Budde still does not teach that "a flex circuit" has a "metal base layer and a plurality of conductors supported by the metal base layer." Such a teaching is simply absent in Budde, and contrary to the examiner's assertion in the final office action, such a teaching is simply absent in

Budde paragraphs [0028] and [0034]. Moreover, paragraphs [0028] and [0034] don't even describe any aspects of Budde's "flex circuit" whatsoever; rather those paragraphs describe Budde's suspension (not the same component).

F. The rejection of claim 9 should also be reversed because Budde does not disclose or suggest a protrusion thickness that is less than an actuator arm thickness.

At least the final rejection of claim 9 depends upon the statement in the final office action that: "Figs. 2 and 3 show that where the tabs are located (202) is thinner than the rest of the actuator arm." This is clearly erroneous for at least two independent reasons.

Firstly, no thickness variation or thickness difference whatsoever is depicted in Figs. 2 and 3. These figures simply show that the suspension load beam area 206 "includes a pair of side rails 222 and 224 that are formed by bending the edges of the load beam upward." See Budde paragraph [0032]. No area is thinner or thicker, one is merely bent upwards.

Secondly, Figs. 2 and 3 depict a suspension 200, not an actuator arm. The suspension includes a base plate area 202, a spring area 204, and a load beam area 206. The base plate of the suspension is "later swaged to an actuator arm," according to Budde paragraph [0029], so how could it possibly already be part of the actuator arm that it is going to be swaged to? The simple answer is that it isn't considered by Budde to be part of the actuator arm.

CONCLUSION

Reversal of the rejections in this appeal is respectfully requested.

The Commissioner is hereby authorized to charge payment of any required fees associated with this Communication or credit any overpayment to Deposit Account No. 23-1209.

Respectfully submitted,

Date: February 6, 2007

By: _____
Joshua C. Harrison, Ph.D., Esq.
Reg. No. 45,686

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VIII. CLAIMS APPENDIX

A complete listing of the claims on appeal:

1. A head stack assembly for a disk drive, comprising:

a stamped actuator arm;

a head gimbal assembly attached to the stamped actuator arm, the head gimbal assembly including a base plate, and a trace suspension flex having a metal base layer and a plurality of conductors supported by the metal base layer;

the stamped actuator arm including:

an actuator arm side surface extending longitudinally along the stamped actuator arm; and

at least two but not more than three longitudinally spaced-apart stamped protrusions, the stamped protrusions being in contact with the trace suspension flex, each stamped protrusion extending from the actuator arm side surface.

2. The head stack assembly of claim 1, wherein the stamped actuator arm further includes a top surface extending longitudinally along the stamped actuator arm, and each stamped protrusion extends from the actuator arm side surface in a direction that is generally parallel to the top surface.

3. The head stack assembly of claim 1, wherein the trace suspension flex is attached to at least one of the stamped protrusions.

4. The head stack assembly of claim 1, wherein at least one of the stamped protrusions has a thickness that is substantially less than that of the stamped actuator arm.

5. A disk drive comprising:

a disk drive base;

a spindle motor attached to the disk drive base;

a disk supported on the spindle motor;

a head stack assembly rotatably coupled to the disk drive base;

the head stack assembly including:

a stamped actuator arm;

a head gimbal assembly attached to the stamped actuator arm, the head gimbal assembly including a base plate, and a trace suspension flex having a metal base layer and a plurality of conductors supported by the metal base layer;

the stamped actuator arm including:

an actuator arm side surface extending longitudinally along the stamped actuator arm; and

at least two but not more than three longitudinally spaced-apart stamped protrusions, the stamped protrusions being in contact with the trace suspension flex, each stamped protrusion extending from the actuator arm side surface.

6. The disk drive of claim 5, wherein the stamped actuator arm further includes a top surface extending longitudinally along the stamped actuator arm, and each stamped protrusion extends from the actuator arm side surface in a direction that is generally parallel to the top surface.

7. The disk drive of claim 5, wherein the trace suspension flex is attached to at least one of the stamped protrusions.

8. The disk drive of claim 5, wherein the integer is 3 and the stamped protrusions are generally equally spaced-apart longitudinally along the actuator arm side surface.

9. The disk drive of claim 5, wherein at least one of the stamped protrusions has a thickness that is substantially less than that of the stamped actuator arm.

IX. EVIDENCE APPENDIX

None.

X. RELATED PROCEEDINGS APPENDIX

None.